

WHAT IS CLAIMED IS:

- 1                    1.        A method for preventing or treating HIV infection, said method  
2 comprising:  
3                    a) screening a plurality of cells to identify stem cells having a beneficial gene;  
4 and  
5                    b) transplanting said stem cells into a patient, thereby preventing or treating  
6 said HIV infection.
- 1                    2.        The method of claim 1, wherein said beneficial gene is a  
2 polymorphism of a gene encoding a protein expressed by immune cells.
- 1                    3.        The method of claim 1, wherein said beneficial gene is one which  
2 reduces the ability of HIV to infect an immune cell.
- 1                    4.        The method of claim 1, wherein said beneficial gene is one which  
2 enhances the ability of an immune cell to neutralize the virus through immune reconstitution.
- 1                    5.        The method of claim 2, wherein said protein is a ligand of a receptor  
2 for HIV entry.
- 1                    6.        The method of claim 5, wherein said ligand is SDF-1 alpha and said  
2 polymorphism is SDF-1 alpha 3'A.
- 1                    7.        The method of claim 5, wherein said ligand is RANTES and said  
2 polymorphism is in the promoter region and increases expression levels.
- 1                    8.        The method of claim 2, wherein said protein is encoded by a gene in  
2 the HLA complex.
- 1                    9.        The method of claim 8, wherein said protein encoded by a gene in the  
2 HLA complex is selected from the group consisting of MHC class I molecule, MHC class II  
3 molecule, TNF, and complement.
- 1                    10.       The method of claim 2, wherein said protein is a receptor or coreceptor  
2 for HIV entry.
- 1                    11.       The method of claim 10, wherein said receptor for HIV entry is CD4.

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- 1                    12.     The method of claim 10, wherein said coreceptor for HIV entry is  
2     CCR2.
- 1                    13.     The method of claim 12, wherein said polymorphism is CCR2-64I.
- 1                    14.     The method of claim 10, wherein said coreceptor for HIV entry is  
2     CCR5.
- 1                    15.     The method of claim 14, wherein said polymorphism is a 32 basepair  
2     deletion in the coding region.
- 1                    16.     The method of claim 14, wherein said polymorphism is CCR5m303.
- 1                    17.     The method of claim 14, wherein said polymorphism is in the promoter  
2     region of CCR5.
- 1                    18.     The method of claim 1, wherein said plurality of cells are obtained  
2     from the group consisting of embryos, marrow, peripheral blood, placental blood, umbilical  
3     cord blood, and adipose tissue.
- 1                    19.     The method of claim 1, further comprising *in vitro* or *in vivo* expansion  
2     of said stem cells.
- 1                    20.     The method of claim 1, wherein said method further comprises  
2     identification of the HLA genotype or phenotype of said stem cells.
- 1                    21.     The method of claim 20, wherein said identification of the HLA  
2     genotype is via a high-throughput method using allele-specific primers and HLA locus-  
3     specific capture oligonucleotides immobilized on a solid phase.
- 1                    22.     The method of claim 1, wherein said screening comprises  
2     identification of stem cells expressing the protein product of said beneficial gene.
- 1                    23.     The method of claim 22, wherein said protein product is detected or  
2     identified using an immunological assay.
- 1                    24.     The method of claim 1, wherein said screening comprises  
2     identification of stem cells with said beneficial gene.

1                    25.     The method of claim 24, wherein said beneficial gene is detected using  
2 a hybridization-based assay, a sequencing assay, or a functional assay.

1                    26.     The method of claim 1, further comprising treatment of said stem cells  
2 to express a non-native HLA protein or to inhibit expression of the native HLA protein.

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